Therefore, only the plurality of first base support surfaces 30, 40, 42 and 40 that cooperate with a first wall plane are perpendicular to the first wall plane. All the other wall planes of the rotor intersect the first wall plane and each other and are not there for parallel. Samuel et al discloses blades 2 which are parallel to a blade on the opposite side of the body 17 when there is no helix angle. The base support surfaces adjacent to the blade walls that are 180° apart are in planes that are perpendicular to two parallel blade walls. This relationship is easy to visualize in two dimensions in Fig. 3 of Samuel et al. Note that Samuel et al discloses only one blade base surface that cooperates with one blade wall to position a blade. If Samuel et al employs multiple short blades in place of one blade extending the length of the body, these blades would all set on the one blade surface in one base surface plane. When a helix angle is provided, the relationship between the blades and the blade positioning surfaces all change. Samuel et al mentions a helix angle but does not discuss how the changed relationships would be accommodated.

Samuel et al does not disclose a rotary cutter with a helix angle, a first groove wall and a first wall plane and a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and wherein all the base support planes that are perpendicular to said first groove wall intersect each other as set forth in claim 1 and explained above. Claim 1 is therefore allowable over Samuel et al.

Claim 2 was rejected as unpatentable over Samuels etal in view of Meis. Applicants respectfully traverses the rejection. Meis discloses a rotor with channels 14. The channels have walls 15 and a base that is perpendicular to the wall. The walls 15 on opposite sides of the rotor are parallel to each other. Their adjacent bases are also in parallel planes. Meis does not appear to suggest a helix angle. Meis does not therefore disclose structure set forth in parent Claim 1 that is not found in Samuels et al as explained above. Claim 2 is therefore allowable together with parent claim 1.

Claim 3 was rejected as anticipated by Samuels etal. Applicants respectfully traverses the rejection. All of the first based support surfaces of Samuels et al, that are perpendicular to the first wall plane, are parallel to each other. Claim 3 is therefore allowable together with parent claim 1 for reasons set forth above.

Claim 4 was rejected as anticipated by Samuels et al. Applicants respectfully traverse the rejection. Claim 4, which is dependant upon claim 1, includes a second groove wall in a second wall plane that intersects the rotor axis, a plurality of second base support surfaces that are perpendicular to the second groove wall and that are each in a second base support plane that is perpendicular to the second wall plane and the second base planes intersect each other. The second wall groove of Samuels etal does not have a plurality of second based support planes that are perpendicular to the second wall plane and intersect each

other. The base support planes of Samuels etal that are perpendicular to a radius and parallel to the rotor axis are parallel to each other. They do not intersect even when there is no helix. Claim 4 as well as parent claim 1 both distinguish over Samuels etal as explained above. Claim 4 is therefore allowable.

Claim 5 was rejected as anticipated by Samuels et al. Applicant respectfully traverses the rejection. Claim 5 is dependent upon claim 4 and is allowable together with claim 4 for reasons set forth above.

Claim 6 was cancelled. The parent claims, as amended, include all the subject matter of claim 6.

Claim 7 was rejected as anticipated by Samuels et al. Applicants respectfully traverse the rejection. Claim 7 is similar to claim 1 with the cutter blades added. The claim includes a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and all the base support planes intersect each other. The wall plane extends outward away from the rotor axis and in the direction or rotation. A plane is a flat surface containing all the straight lines connecting any two points on the surface. Since any two points can be separated apart any desired distance, the plane can extend out in any direction toward infinity. A plane cannot therefore intersect itself. For one plane to intersect another there must be an angle of less than 180° between the planes. Samuels etal shows a flat cutter base support. That surface is in one plane. The specifications suggest that multiple blades can be

number of cutter blades, there is only one blade based support plane disclosed by Samuels et al for each wall plane. The base support surfaces shown in Figures 5B and 5C of Samuels etal are tangents of a circle. The base support surfaces that are 180 degrees apart are parallel to each other if the first and second wall planes include a common radius. If there is a helix angle, two blade wall planes will not be parallel. When viewed from an end, as seen in applicants Figure 4, one wall plane will extend axially into the left while a second wall plane spaced 180° about the axis of rotation will extend axially to the right due to the helix angle Θ (in a plane that is transverse to the axis of rotation). The wall planes as viewed from an end, as shown in Figure 2, also intersect each other due to "extending outward from the rotor axis in the direction of rotation as set forth in claim 7. No two wall planes of applicants' cutter are parallel. Since the wall planes intersect each other a base support plane that is perpendicular to one wall plane will not be perpendicular to another wall plane of the rotor as claimed. Samuel et al discloses only one base support plane that is perpendicular to one wall plane if the rotor is modified to have a helix angle and the angle 22 shown in Figure 4 is negative. In view of the above claim 7 distinguishes over Samuel et al and is allowable.

Claim 8 was rejected as anticipated by Samuels et al. Claim 8 is dependant upon claim 7 and is allowable together with claim 7 for reasons set forth above.

Claim 9 was rejected as unpatentable over Samuels et

Claim 9 was rejected as unpatentable over Samuels et al. Claim 9 is dependant upon claim 7 and is allowable together with claim 7 for reasons set forth above. It is also noted that Samuels et al does not explain how multiple blades could be clamped to one wall plane.

Claim 10 was rejected as unpatentable over Samuels et al. Applicants respectfully traverse the rejection. Claim 10 is dependant upon claim 9 and is allowable together with claims 7 and 9 for reasons set for above. When there are four cutter blades on one groove wall, the blade support surface for each blade must be in a different position relative to the adjacent grooved wall to minimize the hour-glass effect as explained in the specification. The wedge blocks have wedged face surfaces. These surfaces are also wedge shaped from one end to the other as explained in the paragraph starting on page 7, line 8 of Applicants' specification. The system is clearly not just a multiplication of parts. The location of the based surfaces 30, 40, 42 and 44 vary as shown in figure 9. The distance between the blades of one groove wall relative to the blades of the facing groove wall changes as the distance from the axis of rotation changes. The rectangular wedges shown in Figure 9 of Samuels et al will not work if you compensate for the hour-glass effect and have a helix angle. With Applicants' claimed rotary cutter, the angle between a radius and a wall plane changes from one end of each wall surface to the other end.

Claim 11 was rejected apparently as anticipated by Samuels et al. Applicants respectfully traverse the

rejection. Claim 11 includes machining a first groove wall in each of a plurality of grooves that is in a first wall plane extending axially from the left cylinder end wall to the right cylinder end wall and in a first wall plane that intersects the rotor axis, and machining a plurality of first based support surfaces in each of said plurality of grooves that are each in one of a plurality of first based support planes that are perpendicular to the first wall plane and with the plurality of first based support planes intersecting each other and wherein the right end and the left end of each of the first based support surfaces are spaced equal distance from the rotor axis.

Machining in the first groove wall and the second groove wall to form wall planes as set forth in claim 11 results in a groove with a changing width at the outer cylindrical surface of the steel cylinder. Machining the plurality of base support surfaces to minimize the hour glass effect results in the structure shown in Figure 9. To accommodate this structure the wedges must be wedge shaped in a transverse plane relative to the rotor axis. The wedges must also be wedge shaped from one end to the other to accommodate the change and groove widths at the cylindrical surface of the cylindrical shaft. Samuels et al discloses only one base plane associated with each groove wall plane. Samuels etal appears to take the position that there is no hour glass effect. Two other possible methods of correcting for the hour glass effect include employing a knife bed 16 with a curved cutting edge 15 or forming a cutting edge 20 of

knives 2 to correct for the hour glass effect. Forming the cutting edge 20 to correct for the hour glass effect has been used commercially. This system results in a number of different blade shapes making blade replacement in the field difficult.

Samuels et al discloses groove walls in Figures 5B and 5C that are on a radius in one transverse plane through the rotor. When there is a helix angle, the groove wall is radial at only one place along the entire length of the groove wall. As a result, when there is a helix angle, two identical rotors can not be placed end to end to obtain a longer rotor with increased length that form a groove wall in one plane extending the length of the rotor. Applicants' rotor is not a mere duplication of parts. Samuels et al has only a single blade base in a single base plane associated with each groove wall. Claim 11 clearly sets forth a plurality of first base support surfaces in each of a plurality of grooves that are each in one of a plurality of first base support planes that are perpendicular to the first wall plane and with the plurality of first base support planes intersecting each other. Samuels et al does not disclose or suggest any such structure. Claim 11 therefore clearly distinguishes over Samuels et al and is allowable.

Claim 12 was rejected as anticipated by Samuels et al. Applicants respectfully traverse the rejection. Claim 12 includes a helical rotary cutter with a first groove wall in a first wall plane extending auxiliary from the left end to the right end and extending outward away from the rotor axis and

in the direction of rotation, a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and wherein all the base support planes that are perpendicular to the first groove wall intersect each other, and a plurality of flat cutter blades each of which has a base and cutting edge that is parallel to the base. With this structure no two first wall planes are parallel to each other. It therefore follows that the plurality of first base support planes 9 are perpendicular to only one first wall plane. Samuels et al discloses only one base support plane associated with each wall plane when the blade is helical and the angle 22 shown in Figure 4 is negative. In column 4 on lines 21 and 22, Samuels et al states ''Preferably all, of the knives 18 run the full length of 17.'' In column 3, line 42 it is stated ''(of course more than one knife may be present).'' This language most likely means that there are multiple knives 18 that extend the full length of the body 17. It would also be possible to replace one knife 18 with two or more short knives each of which is positioned by one first base support plane. Samuels et al does not show and is not believed to suggest applicants' structure as set forth in claim 12. Claim 12 is therefore allowable.

Claim 13 was rejected as anticipated by Samuels et al. Applicants respectfully traverse the rejection. Claim 13 includes a rotor with a plurality of grooves each of which has a first groove wall in a first wall plane. The first wall plane extends the length of the rotor and extends outward from

the rotor and in the direction or rotation. The first wall plane also intersects rotor axis. The first wall plane as described in claim 13 intersects the rotor axis and all the first and second wall planes. Therefore none of the wall planes are parallel to each other. Claim 13 also includes a plurality of first base support surfaces that are each in a base support plane that is perpendicular to the first wall plane and were in all the base support planes that are perpendicular to the first groove wall intersect each other. Samuel et al discloses only one base support plane that is perpendicular to one first wall plane. Multiple blades can be mounted on each of the Samuel et al base support planes. There will be however, only one base support plane associated with each wall plane if the Samuel et al cutter has a helix angle. Samuel et al does not show or suggest the structure set forth in Applicants claim 13. Claims 13 therefore allowable.

Claim 14 was rejected as anticipated by Samuels etal. Applicants respectfully traverse the rejection. Claim 14 is dependant upon claim 13 and is allowed together with parent claim 13 for reasons set forth above.

Claim 15 was cancelled. The subject matter of the parent claims include the subject matter of 15.

In view of the above this Application as amended is in condition for allowance. Reconsideration and allowance is therefore respectfully requested.

Respectfully submitted,

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